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Symptoms Based Disease Diagnosis & Prediction Using Machine Learning

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Abstract

In a developing world of information and communication technologies, everyone is looking for advanced and easy services, especially the demand for health care services is increasing and necessity of these kinds of applications are in high demand. The basic objective of this study is to design a prediction model for patients. This website is associated with making appointments online in hospitals and providing consultation to the patients regarding appropriate doctors and the primary diagnosis of the disease. By developing web applications users can obtain these benefits as fast as possible in high quality without any obstacle. This leads to expansion ineffectiveness of application in the occasion of epidemics and disease outbreaks. The proposed programming framework comprises fundamental parts. It is in charge of looking for the right doctors, making an appointment with them, the right doctors are in the most noteworthy assessment, with their best reputation, execution in their fields of skill. It will also help to find the appropriate disease for the user/ patients by just mentioning symptoms and also suggesting proper doctors for medication and further process.

Keywords*: Web application, Doctor, Patient, Appointment, Diagnosis, Disease, Symptoms.*

I. INTRODUCTION

Some mobile application accepts appointments by saving the record of the appointment on the phone calendar which gets synchronized with the Google calendar. The user gets an alert before the appointment time and date based on the preset specified time. Systems that are functional still have some drawbacks. To overcome these drawbacks an online patient appointment system is proposed using the Near Field Communication (NFC) technique and Android-enabled mobile application. This system works by registering and scheduling appointments based on NFC that accesses patients' health records and reports to alert nurses and doctors. [1]

Long waiting time is a serious problem for patients using urban health care centers in developing countries. A block appointment system was introduced and evaluated in South Africa health center. Waiting times of all patients were measured over one week period before and after the implementation of the appointment. The study shows that block appointments can reduce patients waiting time for acute patients, but may not be suitable for all patients.

The problem referring to the simulating human behavior, "expert systems also used human knowledge to solve problems that normally would require human intelligence". In some previous systems number of different systems are provided which is related to three issues 1) first one system for managing medical appointments (searching for doctor, booking, cancelling appointments, etc.) 2) concerned about the diagnoses of diseases

using AI such as expert systems, neural networks, fuzzy y systems and deep learning for detecting diseases finally the online health care services system implement intelligent ES capable of advising and recommendations for medical staff and patients to facilitate treatments and disease diagnosing.

II. LITERATURE SURVEY/BACKGROUND

INCREASING THE EFFICIENCY OF ONLINE HEALTHCARE SERVICES SOFTWARE AND MOBILE APPLICATIONS USING ARTIFICIAL INTELLIGENCE TECHNOLOGY."(2020)

This paper is an extension of the work "Medical patient appointments management using a good system in UAE" originally given in "International Arab Conference on info Technology (ACIT'2019)" for example, data Technology and online Services became an important part of our life, of course, this facilitates our it in normal and significant circumstances, particularly within the epidemics crises, all of us will remember for an extended time what happened with the spread of COVID 19, and the way the IT and web technologies were the choice tools for many of our activities like e-learning, online shopping, and even in the medical sectors. Most people as researchers, specialists, students, and developers are trying to feature new values and enhancements to the routine by implementing new applications and software systems. During this work, we are trying to produce a web appointment system supported by an artificial intelligence tool (AIT) to assist patients in searching for appropriate doctors and medical centers, booking appointments, and evaluating their health problems per the unwellness symptoms using AIT, this issue can use for reducing effort, time, and even money. The planned system merges between options of regular medical appointment systems and artificial intelligence medical systems. [7]

EXPLORING THE ROLE OF ONLINE HEALTH COMMUNITY INFORMATION IN PATIENTS' DECISIONS TO SWITCH FROM ONLINE TO OFFLINE MEDICAL SERVICES.

Take in this paper make an analytical study on various data mining and machine learning

Li, Yufei, et al. "Exploring the role of online health community information in patients' decisions to switch from online to offline medical services." International journal of medical informatics 130 (2019): 103951.

It classifies OHC information into objective information and subjective information. Following this, we investigate how these two types of information influence patient decisions to switch from a doctor's online to offline medical service, and explore the nature of the interaction between the two types of influence. They collected data from a leading OHC in China and constructed a longitudinal dataset to examine our research questions. To control for doctor heterogeneity and common trends across time, we leveraged fixed effects at the doctor level and monthly fixed effects in our models, respectively. Patients can access unlimited information reflecting a doctor's service quality in online health communities (OHCs). This information can reduce information asymmetry between patients and doctors, and further promote patient decisions.

In this study, they focused on the patient's decision to switch from a doctor's online medical service to the same doctor's offline service. Explores a new form of patient decision, to switch from a doctor's online to offline service. Finds that the influence of objective information on patient decisions differs from that of subjective information. Suggests that the effects of subjective information on patient decisions can crowd out the effects of objective. [6]

WHEN A DOCTOR KNOWS, IT SHOWS: AN EMPIRICAL ANALYSIS OF DOCTORS' RESPONSES IN A Q&A FORUM OF AN ONLINE HEALTHCARE PORTAL

Khurana, Sandeep, Liangfei Qiu, and Subodha Kumar. "When a doctor knows, it shows an empirical analysis of doctors' responses in a Q&A forum of an online healthcare portal." Information Systems Research 30.3 (2019): 872-891.

Question-and-answer (Q&A) forums could be a user-engagement tool to drive traffic on multiservice portals. In a very platform market model, demand-side users get answers from supply-side users as a result of such answers will indicate worth offered, reduce customer uncertainty, and provide social proof. Analyzing user-generated content on the Q&A forum of an outstanding health care portal, we discover that the introduction of doctors' responses includes an important causative impact on demand-side user perception of medical services offered. A lot of importantly, our analysis suggests that doctors' specialty, experience, qualifications, and transparency in appointment booking, service fees, and response quality moderate the impact of doctors' Q&A responses on user recommendations. These results demonstrate that due to data asymmetry in health care, doctors use thoughtful online responses not only to socially act with patients however additionally to signal their expertise.

Doctors and healthcare service professionals interact with users in an internet marketplace not just for Q&A however also for paid services. Research into user activities on these online Q&A forums, however, is during an emergent stage, and therefore the dynamics of UGC on Q&A forums haven't been analyzed empirically. During this research, we tend to attempt to address this necessary issue. [5]

ONLINE POLYCLINIC AND DATABASE MANAGEMENT SYSTEM} TUFAIL, MARYAM. "ONLINE POLYCLINIC AND DATABASE MANAGEMENT SYSTEM." (2018).

The objective of this thesis was to develop a web Doctor's Appointment and Medical management System in Pakistan. The aim of implementing this application was to form a system through that a patient will simply compare, select and create a web appointment for a doctor simply by sitting at home. The second objective was to exchange the manual medical file keeping system with the web database management system.

The reason behind making this method was the "trend of personal medical clinics" and therefore the manual medical file keeping system in Pakistan. Online appointment and database management systems aim to boost quality treatment by transferring all medical clinics of town to at least one platform, eliminating long waiting lines, and exchanging manual medical file keeping with web information.

The application was with success implemented by using known technologies and programming languages. This application doesn't aim to focus on any specific cluster however each individual who desires to seek medical facilitate which is why it had been kept in mind to stay the user interface easy and friendly while building this application. Like all alternative applications, this application additionally includes a client-side and a server-side. This application was developed by using a Hypertext Mark-up Language, CSS, and JavaScript on the client-side whereas PHP and MySQL on the server-side.

For now, basic functionalities are implemented except for the future, work is done to link pharmacies and laboratories to the system. Online follow-up for distant patients is another feature that's aimed to feature at later stages. [4]

ONLINE WRITTEN CONSULTATION, TELEPHONE CONSULTATION, AND OFFLINE APPOINTMENT: AN EXAMINATION OF THE CHANNEL EFFECT IN ONLINE HEALTH COMMUNITIES

Wu, Hong, and Naiji Lu. "Online written consultation, telephone consultation and offline appointment: An examination of the channel effect in online health communities." International Journal of Medical Informatics 107 (2017): 107-119.

This research examines how online channel usage affects offline channels, i.e., "Online Booking, Service in Hospitals" (OBSH), and the way the channel affects modification with doctors' online and offline reputation.

The study uses information from 4254 doctors from a Chinese online health community. The emergence of online health communities broadens and diversifies channels for patient-doctor interaction. Given restricted medical resources, online health communities aim to produce higher treatment by decreasing medical prices, creating full use of available resources, and providing a lot of various channels for patients. [3]

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III. PROPOSED WORK/SYSTEM

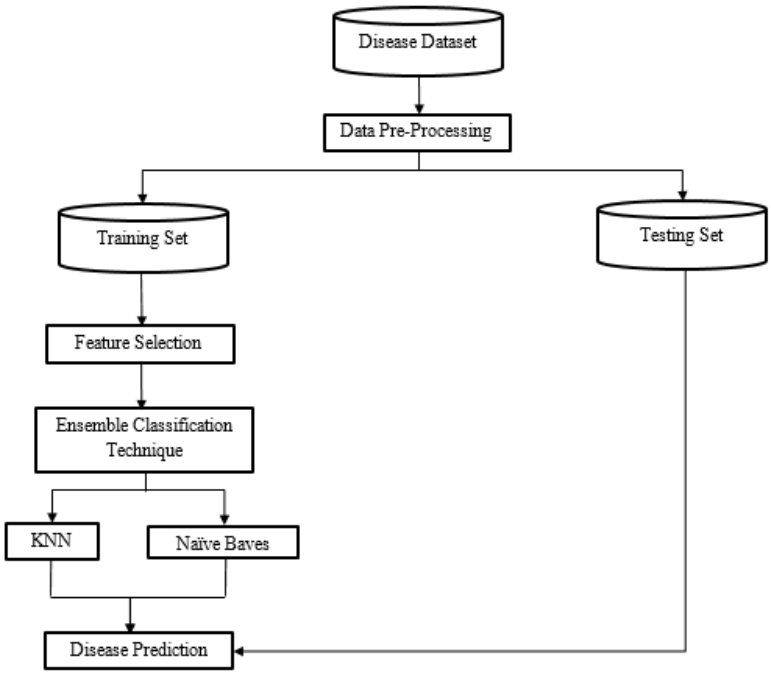


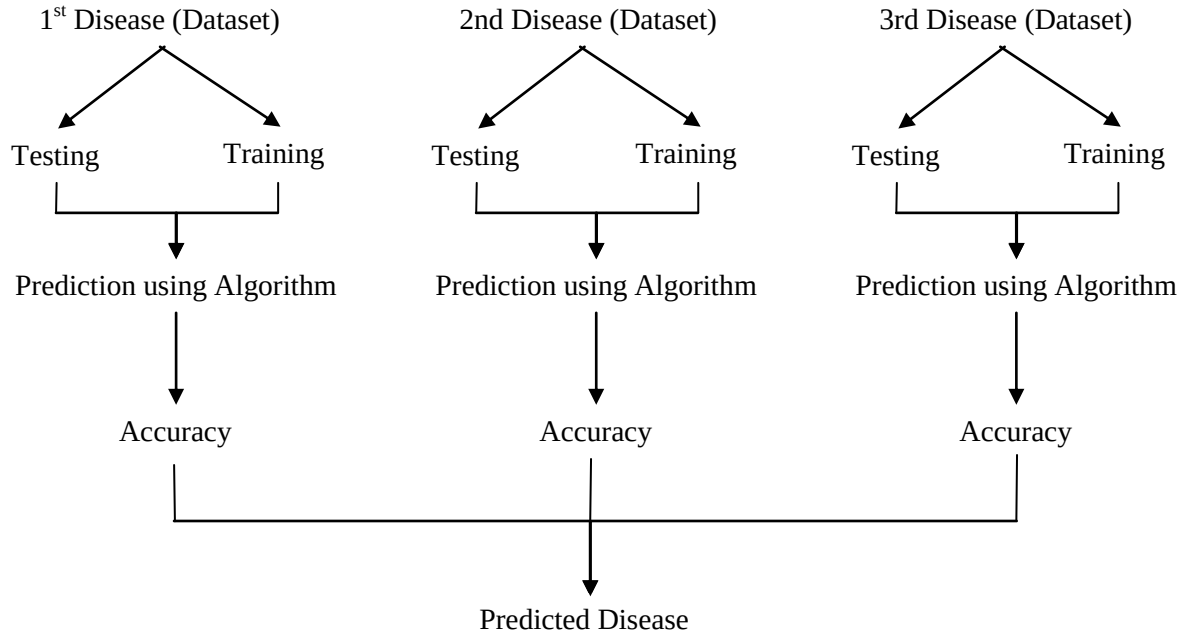
Fig: System Architecture

IV. RESULT AND DISCUSSIONS

Sr. No.	Tool	Dataset Resource	ML Technique	Disease	Accuracy
1.	Python	Lung Cancer	Naïve Bayes	Lung Cancer	88.57%

2.	Python	Breast Cancer	Naïve Bayes	Breast Cancer	93%
3.	Python	Skin Cancer	Naïve Bayes	Skin Cancer	89%

Table: Overview of disease diagnosis technique in ML



V. CONCLUSION

The justification for setting up an automated web-based Doctor Appointment framework is to assist the directors with dealing with the responsibility in a reasonable and helpful way. The innovation utilized here should uphold the framework assuming that it is to stay pertinent to the emergency clinic. To make innovation successful a great deal should be finished. This might include preparing the emergency clinic staff on the most proficient method to enter the right and pertinent information in their framework. Then again, we can recognize the illness, through the manifestations looked at by choosing the indications and tracking down the exact sickness

We implemented this framework for a superior client experience. This framework is exceptionally simple to get to and furthermore it builds up a continuous correspondence media utilizing present-day and refreshed advances. This framework is effectively viable with client gadgets like PC, Mobile Phones, and Tabs. This framework is exceptionally basic and easy to understand.

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